GeoVu

Data Access and Visualization Software

User's Guide

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CONVENTIONS

The following typographic conventions are used throughout this guide.

SMALL CAPS	Dialog box titles.
bold	Titles, keywords, literal strings, fixed file names, and menu item names.
italic	Special terms used in this guide. Also placeholders for information you must provide.
`typewriter`	Text file contents.

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Running GeoVu

Pull-down menus are a familiar part of any windowing application. They appear at the top of the application window and each displays a family of commands when you click on it. The GeoVu menus are File, Edit, Search, GeoReference, Utilities, Windows, and Help. Under Microsoft Windows, Help is also available by pressing the function key F1. The Help Contents panels contain the text from this document.

GeoVu uses its own general methods to find, search, store, and display data. External descriptions of specific data, as files and as collections, provide levels of compatibility with GeoVu's features and operations. A fully GeoVu-compatible data collection is described by a *menu file*. The menu file contains *keywords* used to customize access to data, providing data-specific equivalents for GeoVu's own general methods. Reasonable defaults for the keywords are in place so that many data sets can be accessed without a menu file description. Some GeoVu keywords are found as environment variables (Unix or Windows) or stored in the application's Windows initialization file, **freeform.ini**, or Macintosh preferences file, **GeoVu Prefs**.

In addition to the menu files, GeoVu reads FreeForm data description files, files containing color palette definitions, and other accessory files that specify the display parameters for your GeoVu session. See “GeoVu Accessory Files”.

File Menu

Use this menu to open or close a data file, or quit GeoVu. Usually you will open one or more data files, then use the Search menu to prepare views of the data.

Set Data

Use this option to open a data file by selecting its title. If the data publisher has activated the automatic display function, the data is displayed once you choose it by title. Otherwise, you can either choose Automatic Display from Preferences (Edit menu) or use the Search menu to prepare views of the data.

The last item on the list in the Data Sources dialog is Other Disk Files. This selection is used only to select files that are not part of a collection accompanied by a GeoVu menu file. Data file descriptions make it possible for GeoVu to access data in files, but this is only the first level of compatibility with GeoVu that is possible. In this case, GeoVu presents you with the standard Windows, Mac, or Motif OPEN FILE dialog, titled Select Data File. If you have no collections installed, such as the GeoVu Data Sampler or our CD-ROM data publications, the only title on the list is Other Disk Files. This selection disables the CD or Data Drive editing box.

At the next level of GeoVu compatibility, menu navigation through a collection of data sets is provided by a *menu file*, insulating you from directory paths and file names. A *Data Source* is a collection of data sets, found on a CD-ROM or on hard disk that is described by a GeoVu menu file. The titles you see listed using the **Set Data** menu item are the available data sources in your currently installed configuration. If you do not see expected titles listed, you need to copy the menu file for the product into the GeoVu working directory (GEOVUDIR). To reduce the list, move menu files out of this directory (or rename them).

DATA SOURCES

If the data source selected from the Main List of Data Sources is a CD or special data collection, GeoVu provides hierarchical menu navigation. This dialog guides you through selecting subsets of data from title lists. This menu guide provides a mechanism for finding the data you want without knowledge of the specific directory structure or file names used on the CD or disk.

<<Prev	Return to previous group if there is one, returning up to the introductions, and up to the top: Main List of Data Sources.
Next>>	Display the names of the next group, arriving finally at data file titles. This enables the OK button.
OK	Select the highlighted item. Double-clicking the item also selects it. If the selected item is a data set, it is opened by GeoVu.
CANCEL	Close the dialog without making a selection.
Facts	Display information about the highlighted item in a text dialog.
View	Display the selected ASCII data or text file. This button is disabled if not applicable.

If you select one of the CD-ROM volumes or data collections, you may need to change the drive letter or path in the CD Drive or Data Drive or Home editing box, e.g., S: (PC)

or **/cdrom1**(Unix). If the CD volume found in the drive is not the one selected, you are prompted to insert the correct CD. If the data collection selected is not found on the drive, a warning message is displayed. On a Macintosh, the name of the CD or the hard disk location where the data is located must be correctly typed (though not case sensitive) into the editing box. This is different for every CD you insert and is the drive name that appears on the Mac desktop.

FACTS

<<Prev	Display information about the previous item in the menu list.
Next>>	Display information about the next item in the menu list.
CANCEL	Close the FACTS window and return to the menu guide.

VIEW

This dialog is displayed only when you select a text file from the menu list. The file can contain descriptive text or ASCII data.

<<Prev	Display information for the previous item in the menu list.
Next>>	Display information for the next item in the menu list.
CANCEL	Close the DATA window and return to the menu guide.

INTRODUCTION

When you select a data source by title, an Introduction screen with information about the CD or data collection is usually displayed. Continue by using the Next>> button, or return to the Main List of Data Sources using the <<Prev button. The CANCEL button dismisses the dialogs and returns you to the GeoVu pull-down menu bar.

Using the dialogs discussed above, a specific data set has been selected for use. Before GeoVu proceeds, it checks for a special preview capability. If a summary image of the data has been provided and the GeoVu keyword **preview** has defined to be Yes, the preview image is displayed. You can continue on to create searches of the actual data after dismissing the preview. Preview data corresponding to large data sets are useful as summary information, providing an overview before time is spent retrieving unconstrained data.

PREVIEW

Preview shown. Do you want this data set?

No	Delete the preview image and close the preview data. GeoVu returns to the menu guide.
Open+Disp	Open the selected data set and display it using default settings. This search retrieves all data.
Open Only	Open the selected data set. You will need to define the search using the **Search** menu item **Create**.

FORMAT TYPE

GeoVu attempts to determine the format of the data sets before they are opened. If it fails to find the information, the Format Type Dialog appears. This dialog lists available

common formats plus an UNKNOWN option. If the data file is in a non-standard format, select UNKNOWN, which allows you to continue and enter the necessary information.

See the section "GeoVu Accessory Files" for information about the standard formats list file **stdform.nam**.

DATA TYPE

If GeoVu cannot determine the data type of the input file, this dialog appears. Select one of the three types of data known to GeoVu: Image or Raster, Vector, and Point. In the current GeoVu release, vector data capabilities are not complete.

As GeoVu prepares to open an image data file, the attributes of the image are found. These include: image name, number of rows, number of columns, number of bands, data type, number of bytes per pixel, format, projection, pixel size, and map coordinates of the image boundary. If essential information is not found, the attributes of the image are displayed automatically using the **Image Information** dialog discussed below, as you can also access it from the **Edit** menu. You must type in the missing information. The changes you make affect future searches and displays of the image data, but do not revise the current displays. Also, these changes are lost when the GeoVu session ends.

Close Data

Closes an open data file and cleans up GeoVu references to it. **Close Data** does not close the graphical display windows for the data. This item is disabled when there are no open files. This clean-up makes room for new sources to be set. To use the same CD-ROM drive but a new CD in it, close the previous CD's open files.

Note that there is a limit to the number of files that can be open at once. This limit may be 13 or 14 files under Windows, and it is possible that GeoVu can open a data file not the header file or some other associated file. GeoVu is not able to check for all possible combinations, which may lead to unexpected results. It is best to close files that are no longer of interest.

OPEN FILES LIST

Select the file name from the list of open files to close. Multiple names can be selected.

Exit GeoVu

Exit GeoVu – no dialogs are presented.

Edit Menu

Data Header

This menu item allows you to view and modify (edit) items found in a data file header of an open data source.

RESOURCE LIST

If more than one file is opened, select one from the list that appears.

FILE HEADER

This dialog displays the items from the header and their current values. Any of the values can be modified by typing over the values.

PG UP Display the previous 10 items.

PG DOWN The dialog displays 10 items at once. If the header contains more than 10 items, click this button to display the next 10 items.

OK Save the changes to the header and quit the **File Header** dialog. If the data set is an image, the modified Image Information dialog is displayed.

CANCEL Quit without saving the changes.

Data Formats

This menu item allows you to view and modify (edit) items found in a format description for an open data source.

Image File Information...

IMAGE INFORMATION

You may check and correct each item. Information that is unknown is indicated by the value -9999. For example, this value is often given for the number of rows and columns. Select MODIFY and enter the correct numbers. Also GeoVu may make assumptions about the header or the existence of an embedded header. If these defaults are not correct, you may wish to set the header length to 0 or to the correct value. The information shown in this dialog may indicate that GeoVu is not finding format or other files you need to automate correct access to your data. Select the LIST buttons to display a list of choices for each attribute.

The Image Information dialog appears automatically when needed but you can also access it using the **Edit** menu item **Image File Information...** This lets you review and change image information for subsequent image file access.

MODIFY Allow the fields to be edited for corrections. If some changes are made in the edit boxes, click this button again to reset the boxes back to current values. Note the warning message! Select the LIST option to present a list of choices for each attribute.

OK Accept the modifications as shown and use it to open and read the data. This button is disabled if there are no changes and the dialog is for information only.

CANCEL Dismiss the dialog, without making any changes.

Preferences

Your GeoVu session can be controlled by the settings found in the Preferences dialog. Note the GeoVu Directory is shown to you here. This dialog also shows you the values found for GeoVu keywords associated with an open data set. If no data set is yet open for use, the View Data Keywords button is disabled.

Search Menu

A Search defines the retrieval and display properties of a data set. Those include geographic bounds, scaling method, display type, palette name, etc. This menu allows you to create, revise, or delete a Search definition, and to display the data according to the criteria of the Search.

Create

To access and display an open data set, you must first create a Search. Each data type (vector, point, raster / image) requires different dialogs to completely specify the criteria of the data search, data processing, and the resulting product.

DATA SOURCE SELECTIONS

If more than one data set is open, this selector appears when Create is selected. The data set opened most recently is at the bottom of the list. You must choose one set to be the current working set.

IMAGE SEARCH PARAMETERS

This dialog allows you to set the criteria of the search for image data only. The initial values shown are the defaults which are set automatically. If this dialog is activated by the menu item **Revise**, the current parameter values are displayed. You can change any of these parameters.

Search Name The title which appears in display windows and selection lists. The default is the data source name.

Palette Name This list gives the palettes currently supported by GeoVu. Select the one which is most suitable for your data.

Scaling Type Select a data scaling method for image data. The GeoVu default is to use 16 colors, so data must be scaled to 0-15.

- Linear scaling bins the data evenly by 16 equal intervals between the data minimum and maximum.
- The Linear about 0 option divides the data into two sets of bins scaled above and below the value 0. This is useful for displays of elevations above and below sea-level and topography of coasts.
- Histogram equalization (Histo-Equalized) scales the image data so that each bin contains roughly the same number of pixels.

View Type

- Image or Map creates an image display.

- Save Search Definition Only saves the current search by name without creating a display or file.
- Write To Disk File creates a new file on your hard disk containing the data found when searched according to the criteria.

Set Search Parameter Limits
This button calls the dialogs used to define the area of data to be displayed.

OK Accept the names, types, and search limits defined and produce the View Type.

CANCEL Quit the dialog without saving the current Search definition.

IMAGE OR MAP AREA DEFINITION

This dialog appears for image data only when you choose the Set Search Parameter Limits button in Image Search Parameters and is used to set the area to be displayed or retrieved.

Coordinate System
Allows you to select either **map** or **image** as the coordinate system type used for the display area. If the image is not georeferenced, GeoVu disables the **map** option.

Start Column No (for image coordinates only) / **Left LONG** (for a Lat/Long projection only) / **Left Map X** (for other map projections)
This slide bar allows you to set the horizontal coordinate of the left side of the display area.

End Column No / Right LONG / Right Map X
Allows you to set the horizontal coordinate of the right side of the displayed area.

Start Row No / Top LAT / Top Map Y
Allows you to set the vertical coordinate of the upper side of the display area.

End Row No / Bottom LAT / Bottom Map Y
Allows you to set the vertical coordinate of the lower side of the displayed area.

Band to display
This slide bar is used to specify which band is to be displayed when the data file contains more than one band.

Reduction Scale
This editing box is used to set the reduction scale of display data. The default value is [(number of pixel-1)/(2048*2048)]+1, since 4,194,304 = 2048*2048 is the largest image size GeoVu currently allows.

Display Direction
Sets the row and column sequencing of the display image. You can change the direction by selecting the LIST button to view a list of directions: Normal, Inverse Column, Inverse Row, Inverse Row and Column

OK Quit this dialog saving the changes made and go back to the Image Search Parameters dialog.

CANCEL Quit this dialog without saving changes and go back to the Image Search Parameters dialog.

PLOTS

Search Title the title default is the name of the data source (and is shown in the dialog title line). Edit this title to save search definitions with unique names for use again later.

Terms any information available about the data variables selected below is displayed.

X variable names list
use this drop-down list to select a variable name from those available.

Y variable names list
use this drop-down list to select a variable name from those available.

Set Output/View Type

Simple XY-Plots places the results of the search in an XY-Plot.

Multiple XY-Plots an XY-Plot of several Y variables.

Save Search Only keeps a definition for the search criteria by name.

Write To File places the results of the search into a disk file.

Set Constraints allows you to set one or two additional variable constraints and to limit the X and Y variable range.

GO! is enabled when GeoVu has complete search criteria and is ready to produce the requested plot, search, or file.

Get More Points is enabled when GeoVu has searched data retrieving the maximum number of points allowed. More points, up to the maximum number again, can be retrieved using the same search.

PLOT AXES AND CONSTRAINTS

Set Constraints (discussed above) calls up this dialog, which is used to specify one or two constraints on the point data to be displayed. You can define a range for each variable by entering a minimum and a maximum limit. No limits are imposed if both are set to 0. GeoVu searches for data records in which the first constraint variable, the second constraint variable, the X variable, and the Y variable are all within their limits and plots the values of X and Y variables as a coordinate pair.

X axis set the range for the horizontal axis of the plot.

Y axis set the range for the vertical axis of the plot.

First set the first constraint variable name and set its range.

Second set the second constraint variable name and set its range.

Example

A plot of temperature vs. precipitation may be constrained by limits placed on the LAT and LONG variables associated with the data records, restricting geographical area.

GeoVu finds variable names in the data format information and makes a list of them. It tries to use X, Y, LAT, LONG, or the first names it finds on the list as the default names to use in this dialog.

VARIABLE LIST

Variables may also be set by clicking the associated LIST button to get to the Variable List dialog. All available variables are listed by name for you to select by double-clicking the variable name or by selecting OK.

OK Quit the dialog and replace the variable with the one highlighted in the list box.

CANCEL Quit without changes.

Terms An explanation of the highlighted variable is presented if a text file was provided for use with this feature.

OUTPUT FILE INFORMATION

If the view type in the Image or Plots dialogs is set to be Write To Disk File, use this dialog to provide information that is needed to write a new disk file.

File Name Specify the output file name. The default file name is shown. This file, without a full directory path, is created in the current default directory. You can change the file name or add a complete directory path and name.

Data Type Select the type of file, binary or ASCII, to be written. The default type is the same as the input file. The default file extension used for binary data is **.bin**; for ASCII data it is **.dat**.

Header Type

None No data header is created. The metadata is lost, so the output file will be not readable by GeoVu.

GeoVu A header defined by GeoVu is created in a separate file. The default file extension used for the header file is **.hdr**. The output data file will be readable by GeoVu.

Native A header is created using the header format of the input data set. Information needed for GeoVu compatibility that cannot be written into the native header is placed in an equivalence file (**.eqv**).

Output Lat/Long/Value File

Launches the program **grid2xyz**. This program is only available for Windows.

OK Accept the choices and begin the data processing.

Cancel Quit without processing the data.

PROCESSING INFORMATION

The Processing dialog appears while you wait for the resulting display (or file-writing) and shows the progress. No response is needed, but a CANCEL button is provided if you wish to interrupt the processing.

If an XY Plot is being displayed, a note is displayed in the Processing dialog reminding you of the maximum number of points GeoVu will plot. Before the processing finishes, the dialogs below are presented so you can set plotting attributes such as marker types and colors.

Revise

Change properties of an existing Search. The dialogs that are encountered for the **Revise** menu item are the same as presented for **Create** (see above).

Be sure to give the new Search a unique name and delete the original Search if you wish.

Delete

Remove a Search that will not be used again.

SEARCH SELECTION LIST

If more than one Search has been specified, this dialog presents a list of available Searches by name. Choose the Search you want to delete.

Display

Display the results of a Search. You may not get what you expect if one Search exists, another data file has just been opened, and you select **Display** form the **Search** menu. If no Search definition has been created for the new data set, you get a display of the Search that already exists.

SEARCH SELECTION LIST

If more than one Search has been specified, this dialog presents a list of available searches by name. Choose the Search you want to display.

GeoReference Menu (GeoRef)

This menu allows a fixed-format coastline file and a geopolitical bounds file to be read into the session. These files can then be used as vector overlays on map images.

This collection is available as an overlay to a map image display using the OVERLAY control button found on image display windows. Non-linear projections are not yet supported. The underlying image must be of georeferenced data (having lat/lonbounds). Georeferenced point

overlays for map images must first be created using the point data plotting feature of GeoVu. Then they will be available through the OVERLAY button.

The Image Information dialog indicates that the projection is specified as Lat/Lon or you can use the **Edit** menu item **Image Information...** and click the MODIFY button to set this. Also the four range values must be set so that the image is registered within GeoVu's own map coordinates. GeoVu uses an internal coordinate system for these overlay files of -180 to 180 and 90 to -90. Only contiguous ranges within this system are used by GeoVu, although it resets coordinates that are specified with a longitude range within 0 to 360.

The two files used in GeoVu to provide coasts and boundaries are derived from portions of Micro World Databank II.

> Pospeschil, Fred 1992. Micro World Databank II
>
> Coastlines, Country Boundaries, Islands, Lakes and Rivers. Digital vector data at 1 minute resolution. In: Global Ecosystems Database Version 1.0: Disc A. Boulder, CO: NOAA National Geophysical Data Center. 6 independent single-attribute spatial layers on CD-ROM, 2.5 MB.

Load GeoVu Rivers/Coasts

Select **Load GeoVu Rivers/Coasts** to open the file of lat/loncoordinates to be used and displayed as coastal boundary lines. GeoVu provides one world coastline data file, called COAST.DAT. If the file COAST.DAT is not found in the working directory, you are prompted for the file name and directory with the standard open file dialog.

The binary file is in the format: one 4-byte LONG value specifying the number of pairs to follow, followed by sequential pairs of LONG coordinates (representing lat/lon).This repeats for connected line segments until the end of the file. No area searches can be done on these files. GeoVu uses an internal geo-referencing system that expects a resolution multiplier value of 1000 has been applied to the range of -180 to 180 and 90 to -90.

Load GeoVu Boundaries

Select **Load GeoVu Boundaries** to open the file of lat/lon coordinates to be used and displayed as country/state boundary lines. GeoVu provides one world boundaries data file, called BOUNDS.DAT. If the file BOUNDS.DAT is not found in the working directory, you are prompted for the file name and directory with the standard open file dialog. This binary file has the format described above for the coastlines data.

Display GeoRef Overlay

The collection of overlay elements may also be displayed without an image under it. To create this type of display, select the menu item **Display GeoRef Overlay**. The controls available on this display are discussed in the section **GeoRef Overlay Display Controls.**

Utilities Menu

Slide Show...

This menu item allows you to sequentially display data sets from a fully-compatible data source. This menu item is available only when a menu file is provided that contains a section called **SLIDE SHOW** and that section contains the word TRUE. The description of the data collection includes this keyword to notify GeoVu that animations of image displays would be appropriate.

SELECT SLIDES

This dialog is similar to the dialog presented by the **Open Data** menu item and is used to select files for display. The data set title is shown in the dialog title line.

The Data Source box lists all items at the current level of the data menu. To select an item for the slide show, double-click the item. A * before the name of a menu item indicates that item has been selected. Double-click a selected item again to unselect the item and remove the mark. Once an item has been selected, all files under this in the menu hierarchy are selected with it. If this item is an individual file, it is at bottom level of the data source menu and no other files are selected. To select every data set available in the source, just select all items in the top-level menu.

Facts	Display information about the highlighted item in the list box.
Select All	Select every item in the list box.
<<Prev	Go back to the parent level menu of the current menu.
Next>>	Go to the submenu highlighted in the list box.
OK	Available only after items are selected. Click this button to start the show.

In some data collections, a prepared image file corresponding to a data file may be available. The data producer can write the data collection's GeoVu menu file to allow the display of prepared images for, giving the extension of the image file type. For example, there may be a PCX file accompanying each real image data set. Keyword **slide_show_ext** should be defined as PCX in the menu file (in the default equivalence table). This notifies GeoVu that there are .PCX data files as well as original real data sets that can be used for slide shows. The following dialog appears only if the keyword **slide_show_ext** is found in a menu file.

SLIDE SHOWS DATA TYPE

After selecting slides, you may (infrequently) be asked to specify the type of data to show. The two choices are REAL DATA or another type which is specified. Use of the real image data file could be slow! Choosing the prepared corresponding image of the data may be faster.

SLIDE SHOW

This dialog controls the slide show. You can move this dialog window to any location for a better look at the slide show session. The data file name shown is the current file being prepared and the percentage of the file that has been read is shown.

Step mode	Waits for you to click the Next button before presenting the slide.
Continuous mode	Displays the slide as soon as it is ready.
Next	Displays the slide. Enabled only for Step mode.
Cancel	Stops the slide show.

File Conversions (newform)...

NEWFORM UTILITY

To select every data set available in the source, just select all items in the top-level menu.

Input Format

Output Format

Format Titles

Process all records first n records last n records

Variable File

OK

CANCEL

File Checking (checkvar)...

CHECKVAR UTILITY

To select every data set available in the source, just select all items in the top-level menu.

Input Format

Precision

Number of histogram bins

Ignore Data Value

Max/min output only

Process all records first n records last n records

Variable File

OK

CANCEL

Image Processes...

The **Image Processes** menu item presents the following dialog only if an image display window is selected as the active window.

This allows an image display currently in a selected window to be re-computed into a new image which is smaller or larger. That image is displayed in a new display window. Note that the new image is not associated with the working data set that generates the original.

View File Histograms

Histogram information may be available as metadata to be displayed and examined. The histogram plots show the occurrences counted for values of a variable. This feature is for browsing pre-computed histogram information and does no data processing or computations.

For processing histograms of displayed images (pixel color frequency), click the HIST button found on the image display control panel.

HISTOGRAMS

Each Histograms dialog works with only one open data set. The data set title is shown in the dialog title line. To view histograms for another open data set, close this window and return to the Histograms menu item.

Variable Select from the list of variable choices.

Terms Definitions or other information about the highlighted variable are shown if descriptive text has been provided.

Windows Menu

Status

Select this menu item to bring the status window to the front, listing open data files and searches created.

Close All Displays

This menu item removes all the display windows, but does not close files or delete searches.

(Window Titles)

The other Window menu items are titles of all the GeoVu display windows and the always-present status window. Select a title to bring the corresponding window to the front.

Help Menu

On a Macintosh running System 7.5 or later, this menu is under the ? Apple Guide icon on the right side of the menu bar.

Contents

This selection allows you to browse the contents of GeoVu help text, which matches the material in this User's Guide. This same help text is available under Microsoft Windows by pressing the F1 function key. Note that if the GeoVu help file was not found when the session started, there is no response when Contents is selected.

About, On Version

This selection presents information about the GeoVu release, version number, and shows the support contact and a button for HELP Contents display. Motif releases call this item On Version.

Interactions with the Display Windows

GeoVu display windows present graphics for images, plots, georeferenced points and vectors. Each has a set of button controls and customary decorations used by Windows, Macintosh, or Motif applications.

Under Windows, an enlarge box and a close box (and its menu) are available at the top of each window. Motif windows do not have the enlarge box. To resize a window, click and hold on the window's frame and drag the frame in the desired direction. Double click within the title bar area to enlarge and restore window size. The window is refreshed with an updated display. If you hold the left mouse button down and drag the title bar, the window follows the mouse movement if it is moveable.

When an entire display is not shown in the display window's drawing area, active scroll bars appear to provide panning of the display. Under Windows, inactive scroll bars are removed but under Motif and Macintosh they remain visible.

For more information, see the following sections: “Image Display Controls”, “GeoRef Overlay Display Controls”, and “Plot Display Controls”.

Image Display Controls

The display of raster data is presented in an image display window, titled with the data search name. The following image display features and controls are available:

- A status bar along the bottom display area prompts about cursor interactions.
- A color swatch legend shows the current color palette.
- Cursor interactions with the window: Double click within the image to select a point and display its row and column, color index, and other information.
- The OVERLAY dialog is presented only when the image is georeferenced; then it toggles drawing flags and colors for georeferenced vector and point data sets, including a world grid and elements added to the session using the GeoReference Menu. This feature is particularly useful with lat/lon plots.

- The COLOR control dialog presents a list of palette names for selecting a replacement color palette and also shows the current colors and data ranges. OKAY updates the image display to show the changes. CANCEL quits the dialog without changes to the image display.
- ZOOMIN allows a region to be selected by a cursor-controlled rubber band box. You can repeat this until precision fails or the image stretch distorts too much.
- ZOOMOUT undoes the last ZOOMIN.
- SAVE the window's image only to a PC PCX file (run-length encoded or not) or a PC DIB file (this is a **.bmp**), or a GIF file (Motif only), or a PICT file (Macintosh only). You are prompted for a name for the output file.
- PROFILE lets you enter a transect line across the image, then it creates and displays an XY-Plot defined from the color indices along that line. If the shift key is held down, you can select a series of connected points to make the transect path. Release the shift key to enter the final endpoint.
- REGION allows an area selection by clicking and dragging the mouse. You must enter a name tag for this region and it is then saved throughout the session for use in named retrievals.
- FACTS presents information about the data that is being displayed.
- HIST (histogram) creates a plot definition from values ranging between 0.0 and 1.0 that describe the color frequencies of the image. This plot is presented in a new XY-Plot Display Window.

GeoRef Overlay Display Controls

This type of display presents georeferenced vector and point data without an underlying map image. This is the type of display window that appears when the menu item Display GeoRef Overlay is selected from the GeoRef menu. The following Overlay Display controls and features are available:

- A status bar along the bottom display area is used to show results and prompts about cursor interactions. Double-mouse clicks within the display show GeoVu vector map coordinates here.
- OVERLAY dialog toggles drawing flags and colors for session's georeferenced vector and point sets.
- ZOOMIN allows a region to be selected by a cursor-controlled rubber band box. You can repeat this until precision fails or the image stretch distorts too much.
- ZOOMOUT undoes the last ZOOMIN.
- REGION allows an area selection by clicking and dragging the mouse. You must enter a name tag for this region and it is then saved throughout the session for use in named retrievals.

Scrolling through the display of a line drawing is very slow, so you do not see the coastline or boundaries during the scrolling. When you are done scrolling you can recover the line drawing part of your display by forcing the screen to be redrawn. One way to do this under Windows is to click on the title bar.

Plot Display Controls

This type of display is a 2D data plot, also called an XY-Plot. Also see the discussion of **Search** dialogs. The following Plot Display control features are available:

- OVERLAY toggles the grids and labels on a plot.
- LEGEND control dialog presents the name of each data set and allows changes to its display attributes. You can specify new line types or symbols or "undraw" the current plot by using the Change Symbols button and Change Dataset Display Attributes dialog.

CHANGE DATASET DISPLAY ATTRIBUTES

A drawing method is specified by using the radio buttons and setting the corresponding attributes. Also a color for gridding may be chosen.

CANCEL Stop the plotting process.

UNDRAW Removes the plot.

OK Accept the settings made and continue.

- ZOOMIN allows a region to be selected by a cursor-controlled rubber band box. You can repeat this until precision fails or the image distorts too much.
- ZOOMOUT undoes the last ZOOMIN.
- SAVE creates a **.bmp** file (or PICT file on Macintosh) from the screen image created for this plot. A standard Save File dialog asks for the file name.
- DATAOUT creates a file from the data created for this plot. A standard Save File dialog asks for the file name.
- REGION allows an area selection by clicking and dragging the mouse. The results are passed back to the application. Saving the regions is not yet completed in GeoVu.
- FACTS presents information about the data that is being displayed.
- CUSTOM allows you to customize the appearance of the plot. Future enhancements are planned.

SPECIFY PLOT DISPLAY ATTRIBUTES

A linear or log scale may be requested. Labels may be changed here. Also a background color may be chosen.

GeoVu Accessory Files

The files below are provided with GeoVu or generated by it. Most are not required, especially when Disk Files are the only data sources and not CDs. All of these files may not have been installed with GeoVu.

GeoVu's Help File

This file (**g2_.hlp**) provides the text of the instructions and the help panels–it is not otherwise readable. If it does not reside in the GeoVu working directory, then GeoVu prompts for the file name. GeoVu can be run without this file but no help text will be displayed.

To obtain hard copy documentation for GeoVu (*Getting Started with GeoVu*, this user's guide, and the *GeoVu Tools Reference Guide*), send the **gv*.eps** files found in the GeoVu installation directory to a PostScript printer.

World Coastline, Bounds Files

GeoVu uses two binary georeferenced vector files, derived from Micro World Data Bank II data files. The world coastline file is COAST.DAT and the geopolitical boundaries are in BOUNDS.DAT. These have a fixed format used directly by GeoVu displays. (The values are scaled by a resolution factor and are represented as longs. The files are sequences of the number of points in one continuous segment, followed by the point pairs of that segment.)

Menu (.men) Files

GeoVu is compatible with many CD-ROM discs and special data collections, such as the GeoVu Data Sampler and NGDC CD-ROM volumes. For each, menu files describe the hierarchical file organization of the CD-ROM volume or data collection. They are ASCII files that also include descriptive "facts" text, data format specifications, header format specifications, and naming equivalence tables. We use the file extension **.men** for the menu file name. Read the chapters "Menu Files" and "GeoVu Keywords" in the *GeoVu Tools Reference Guide* for detailed information.

The menu files are distributed on CD-ROM and from **ftp.ngdc.noaa.gov**. Corrections and updates may appear in the FTP directory. Copy these files into your GeoVu installation directory. Not all data collections have corresponding menu files. You may also wish to write one for your data. See the *GeoVu Tools Reference Guide* for details.

At start-up, GeoVu tries to build the list of data sources by locating all menu files in the GeoVu working directory. If none are found, then the only data source is Other Disk Files. Copy any **.men** files you have obtained on CD-ROM, diskette, or from our FTP location, into your GeoVu working directory (GEOVUDIR).

Format Description (.fmt) Files

GeoVu must be supplied with *format description files* as defined in the *FreeForm User's Guide***.** FreeForm is the Data Access module of GeoVu and is documented separately, since GeoVu is only one of many applications that use FreeForm. The user's guide describes the syntax and naming conventions of the companion files which must be supplied along with data files. These files are used by GeoVu when reading data, but if they are not available GeoVu tries to use default information.

Formats List File stdform.nam

In order to read a file properly, GeoVu needs to know the data type and data format and some GeoVu reserved words (keywords) must be given meaningful equivalents. GeoVu searches for this information first in accessory files found in the directory where the data file resides. If the current data file is from a collection described in a GeoVu menu file, GeoVu also searches sections of its corresponding menu file.

If the necessary information is not found, GeoVu displays a list of the standard formats from the file **stdform.nam** for you to select. The **stdform.nam** file is an ASCII file which defines commonly-used data formats, associating a name for the format type with the base filename which is used to find the format information.

You may edit **stdform.nam** to add new formats. Each line in the **stdform.nam** file contains two strings separated by a space. The first string is the name you give the format, as it will appear on the selection list of the Format Type dialog. The second part is the corresponding base file name. GeoVu uses the base to compose the format file names and equivalence table file names it expects to find and use. GeoVu expects the equivalence table file to reside in the GeoVu working directory.

Example: stdform.nam is shown below, as it is distributed with GeoVu:

```
AVHRR_GAC_1b_unpacked gac16
Binary_raster_user_defined user
BMP_image bmp
ERDAS_raster erdas_ra
GEOVU_raster geovu_ra
IDRISI_raster_version3 idrisi3
IDRISI_version4 idrisi4
McIDAS_PC_IMAGE mcidas_d
McIDAS_UNIX_IMAGE mcidas_u
Modified_DTED_DEM_format dted
PCX_Image pcx
UNKNOWN unknown
```

In **stdform.nam** you see the GeoVu keyword: UNKNOWN, which is used if the current data file is not in one of the standard formats.

Some standard file types cannot be described by FreeForm format descriptions and GeoVu equivalence tables. They are not listed in **stdform.nam** but may be understood by GeoVu only because of their file extension; this is true for GIF files ending with **.gif** extensions. Also supported are some types of **.hdf** files and **.mvv** movie files.

Name Table / Equivalence Table (.eqv) Files

Equivalence tables define and describe names used in a data file or used by data files of one type, equating these names to reserved keywords used in GeoVu. The text files that contain an equivalence table must have the file extension **.eqv**. The contents may also be placed as a section in a GeoVu menu file. Please see “Equivalence (Name) Tables” in the *GeoVu Tools Reference Guide,* for details. Several **.eqv** files are distributed with GeoVu: those used for the standard format types entered in the **stdform.nam** file described above.

GeoVu's Palettes List File

The palettes list file is an ASCII text file distributed with GeoVu that contains a collection of color table definitions. At session start-up, these tables (palettes) are available to GeoVu. Other palettes list files may be supplied with CD-ROM data collections, and they may replace the start-up color palettes during run-time. The menu files for those collections may specify a file to use in place of the start-up palettes file. You may also edit file **geopal.lst** to add or remove or change color palettes.

This file is optional. Without this list file, GeoVu starts with only two color palettes available: a 16 pure color VGA palette and a gray scale 16 color palette.

The first line of each palette definition is **palette_name*. Each name found in the file appears in the lists in GeoVu dialogs that control your selection of color palettes. The color specification is

a line of four values separated by spaces: an index, red, green, and blue. The value range for red, green, and blue is from 0 to 255. An example of color palette:

```
 0 55  0 67
 1  0  0 45
 2  0  0 63
 3  0  0 95
 4  0  0 127
 5  0  0 159
 6  0  0 191
 7  31 0 223
 8  0  131 195
 9  0  191 131
10  0  187 79
11  0  255  0
12  139 255  0
13 207 255  0
14 255 255 127
15 255 255 255
```

This text can be placed in the palettes list file under its name or kept in a separate file (we use the **.pal** extension). The separate palette file can be linked into the palettes list file:

- ➔ To link the name of a palette to a **.pal** file on CD-ROM, the first line of the color table is replaced by &*palette_file_name* (with a full directory path but without CD-ROM drive letter).
- ➔ To link to a palette file in the GeoVu working directory, the first line of the color table is replaced by ^*palette_file_name.*

An example from part of the **geopal.lst** file:

```
*BGY
  0 55  0 67
  1  0  0 45
  2  0  0 63
  3  0  0 95
  4  0  0 127
  5  0  0 159
  6  0  0 191
  7  31 0 223
  8  0  131 195
  9  0  191 131
 10  0  187 79
 11  0  255  0
 12  139 255  0
 13 207 255  0
 14 255 255 127
 15 255 255 255
*GVI
&\1month\mypals\gvi.pal
*QUAL
^qual.pal
```

The file in the above example defines three palettes: BGY, GVI, and QUAL. The palette BGY is defined directly; palette GVI is defined in the CD-ROM file **\1month\mypals\gvi.pal**; and palette QUAL is defined in the file **qual.pal** in GeoVu working directory.